

REMARKS

Claims 21-23, 25, 42-64 and 68-70 are pending, with claims 21, 47 and 56 being independent. Claims 21, 47 and 56 have been amended. Support for the amendments may be found in the specification, for example, at page 14, lines 3-13 in the discussion of *Features of the Unique Crystal Structure Body*, on page 39, lines 26, 27; page 40, lines 1-16; and in FIGS 5E, 17A and 17B, and the related description. More particularly, independent claims 21 and 56 have been amended to recite that “the semiconductor film is configured for a heat treatment exceeding 700°C to remove a catalytic element by gettering.” These features are supported in the specification at page 14, lines 3-13 in the discussion of *Features of the Unique Crystal Structure Body*. This section of the specification, which also discusses FIGS. 17A-17D, describes that “the crystallinity of the crystal structure body is extremely improved by a heat treatment at a temperature exceeding 700°C in an atmosphere containing a halogen element, and a catalytic element is removed by gettering so that the catalytic element does not cause any problem.” This feature is also described on page 39, lines 26, 27, and page 40, lines 1-16:

Next, as shown in FIG. 5E, a heat treatment for removing the catalytic element (nickel) by gettering (gettering process of the catalytic element) is carried out. This heat treatment uses a gettering effect of a metal element by a halogen element. In order to obtain the gettering effect by the halogen element, it is preferable to carry out the above heat treatment at a temperature exceeding 700°C. Thus, in this embodiment, the heat treatment is carried out at a temperature exceeding 700°C, preferably 800 to 1,000°C (typically 950°C), and the processing time is 0.1 to 6 hours, typically 0.5 to 1 hour.

Here, there is shown an example in which a heat treatment at 950°C for 30 minutes is carried out in an oxygen (O₂) atmosphere containing hydrogen chloride (HCl) of 0.5 to 10 vol % (3 vol % in this example). When the concentration of HCl is made higher than the above concentration, the unevenness comparable to the film thickness is formed on the surface of the active layer 209, so that the higher concentration is not preferable.

No new matter has been presented.

Claim Rejection under 35 U.S.C. § 112 - Claims 25 and 59

Claims 25 and 59, which depend from independent claims 21 and 56, stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Office asserts that at least the combination of the limitation of "a halogen element is contained in said semiconductor film with a concentration of 1×10^{15} to 1×10^{20} atoms/cm³" in claims 25 and 56, which restricts the invention to the second embodiment, and the range for the value of the "channel length of said channel formation region is 2 μm or shorter" in claims 25 and 59, are not supported by the specification as originally filed. Without submitting to the propriety of the rejection, claims 21 and 56 have been amended to delete "wherein a halogen element is contained in said semiconductor film with a concentration of 1×10^{15} to 1×10^{20} atoms/cm³."

The features of claims 25 and 59 reciting that "a channel length of said channel formation region is 2 μm or shorter" are supported within the section of the specification for the *Features of a TFT using the Unique Crystal Structure Body* (Specification: page 19, lines 12-18). Therefore, these features of claims 25 and 59 are not new matter.

For at least these reasons, the rejection of dependent claims 25 and 59 should be withdrawn.

Claim Rejection under 35 U.S.C. § 112 - Claims 47-55

Claims 47-55 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Office asserts that at least the combination of the limitation of "a halogen element is contained in said semiconductor film with a concentration of 1×10^{15} to 1×10^{20} atoms/cm³," which restricts the invention to the second embodiment, and the presence of two separately-claimed films, i.e., the "gate insulating film" and the "thermal oxidation film" in "a gate electrode provided adjacent to said channel formation region with a gate insulating film therebetween, and a thermal oxidation film provided between the semiconductor film and the gate electrode," as recited in claim 47, are not supported by the original specification. The Office asserts that the thermal oxidation film is part of the thirteenth

embodiment, and a combination of the second and thirteenth embodiment is not disclosed. Without submitting to the propriety of the rejection, claim 47 has been amended to delete “wherein a halogen element is contained in said semiconductor film with a concentration of 1 x 10¹⁵ to 1 x 10²⁰ atoms/cm³. ”

For at least these reasons, the rejection of independent claim 47 and dependent claims 48-55 should be withdrawn.

Claim Rejection under 35 U.S.C. § 112 - Claims 21-23, 25, 42-64 and 68-70

Claims 21-23, 25, 42-64 and 68-70 stand rejected under 35 U.S.C. § 112, second paragraph, as being incomplete for omitting essential elements that result in a gap between the elements. The Office asserts that the omitted elements involve the simultaneous, rather than alternative, presence of hydrogen and halogen elements, as disclosed through the use of gettering means of a chemical substance including both hydrogen and a halogen (e.g., HCl, HF, HBr). Without submitting to the propriety of the rejection, claims 21, 47 and 56 have been amended to change “hydrogen or halogen elements” to “hydrogen and halogen elements.”

For at least these reasons, the rejection of independent claims 21, 47 and 56, and dependent claims 22, 23, 25, 42-46, 48-55, 57-64 and 68-70, should be withdrawn.

Claim Rejection under 35 U.S.C. § 112 - Claims 21-23, 25, 42-64 and 68-70

Claims 21-23, 25, 42-64 and 68-70 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter regarded as the invention. The Office asserts that a broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, and in the present instance, the independent claims recite the broad recitation “hydrogen or halogen,” and the same claims also recite a narrower limitation of “a halogen element is contained in said semiconductor film with a concentration” as recited in independent claims 21, 47 and 56. Without submitting to the propriety of the rejection, claims

21, 47 and 56 have been amended to delete the features of “a halogen element is contained in said semiconductor film with a concentration of 1×10^{15} to 1×10^{20} atoms/cm³. ”

For at least these reasons, the rejection of independent claims 21, 47 and 56, and dependent claims 22, 23, 25, 42-46, 48-55, 57-64 and 68-70, should be withdrawn.

Claim Rejection under 35 U.S.C. § 112 - Claims 25 and 59

Claims 25 and 59, which depend on claims 21 and 56, stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter regarded as the invention, and the metes and bounds of the claimed invention are vague and ill-defined due to the lack of adequate written support as a result of the introduction of new matter, as set forth in Section 3 in the Office Action. Without submitting to the propriety of the rejection, claims 21 and 56 have been amended to delete “a halogen element is contained in said semiconductor film with a concentration of 1×10^{15} to 1×10^{20} atoms/cm³. ”

For at least these reasons, the rejection of dependent claims 25 and 59 should be withdrawn.

Claim Rejection under 35 U.S.C. § 112 - Claims 47-55

Claims 47-55 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter regarded as the invention, and the metes and bounds of the claimed invention are vague and ill-defined due to the lack of adequate written support as a result of the introduction of new matter, as set forth in Section 4 in the Office Action. Without submitting to the propriety of the rejection, claim 47 has been amended to delete “wherein a halogen element is contained in said semiconductor film with a concentration of 1×10^{15} to 1×10^{20} atoms/cm³. ”

For at least these reasons, the rejection of independent claim 47 and dependent claims 48-55 should be withdrawn.

The claims were previously rejected over Okamura (JP 08-306928). Applicants note that Okamura neither describes nor suggests that “the semiconductor film is configured for a heat

treatment exceeding 700°C to remove a catalytic element by gettering,” as recited in each of the independent claims. Instead, Okamura describes that a heat treatment should be performed in a hydrogenation method of 200°C-400°C (Okamura: claim 2, paragraphs [0008], [0009], [0021]). Thus, Okamura describes that the process should be a low temperature process and teaches how the substrate temperature should be less than 450°C.

All claims are in condition for allowance.

Conclusion

It is believed that all of the pending issues have been addressed. However, the absence of a reply to a specific rejection, objection, issue, or comment, including the Office Action’s characterizations of the art, does not signify agreement with or concession of that rejection, issue, or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment or cancellation of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment or cancellation. Applicant reserves the right to prosecute the rejected claims in further prosecution of this or related applications.

The fee in the amount of \$130 for a One-Month Extension of Time is being paid concurrently herewith on the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other charges or credits to Deposit Account No. 06-1050.

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Respectfully submitted,

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